ESV vs. FS

The following document is a response to FWCC's presentation dated on July 29th 2004.

In the above presentation FWCC presented two examples of ways to calculate interference level.

Here are our remarks:

1) The assumption that FS and ESV transmit at the same BW is wrong. FS transmits 3MHz and up while ESV transmits 64-128Kbps.
2) The assumption that ESV minimum look angle is: 10º is wrong. The minimum angle is: 20º.
3) ESV transmit power (at the HPA output) is: 33dbm @64Kbps and 35dbm @128Kbps
4) The assumption that FS and ESV antennas don't have azimuth angle between them is not reasonable. 20º Azimuth shift is more practical..
5) FS antenna is more likely to be: 3' (8' antenna is rare and will need special structure to support wind load).
6) Although the minimum discernible signal of the standard Microwave system is -70dbm the received signal is at least 25db higher to overcome fading.
7) The only criterion to determine interference is S/(N+I) >= S/Nmin(=34db)
8) We assumed negligible NF and cable loss, as they affect the signal and the interference in the same way.

Here's our calculation:
ESV and FS distance:10 miles
Path loss: -132db
ESV transmit power: 35dbm (worst case)
ESV antenna gain @EL20º/AZ20º = -4dbi
FS antenna (D=2') @AZ20º = -4.7dbi

Signal: Mating FS signal at receiver input: -70dbm + 25db = -45dbm

Interference: ESV signal at receiver input: 35dbm +(-4dbi) – 132db -4.7dbi = -105.7dbm

Noise level: F=6GHz, T=290ºK, BW=3MHz = -139dbm

It means that: S/(N+I) = 60.7db >>34db

Even if we take the 8' antenna case with azimuth shift of 20º the result will be: S/(N+I) = 56.4db >> 34db

The above proves that ESVs do not interfere with FS.